REMARKS

A Final Rejection was mailed in the present case on January 13, 2006, making a response due on or before April 13, 2006. Since this response is being submitted in a timely manner, along with a Request For Continued Examination, no extension fee is thought to be due. If any additional fee is due, please charge the same to Applicant's Deposit Account No. 50-2555 (Whitaker, Chalk, Swindle & Sawyer, LLP).

Applicant's invention deals generally with the field of "dual wall" drill pipe. Dual wall pipe offers a number of advantages in certain types of drilling applications which are not available with single wall drill pipe. With traditional single wall pipe, the circulation is accomplished by pumping the drilling fluid through the interior of the drill pipe to the drill bit and by returning the used fluid and cuttings up the well annulus to the well surface. A dual wall pipe has the advantage of isolating the cutting carrying fluid from the well annulus, thereby offering less chance of plugging, lessening the chances of forming unwanted fractures, and being generally more environmentally friendly.

While dual wall drill pipe has existed in the past which allowed "reverse circulation" or "dual circulation", the designs were a rigid pipe-within-a-pipe style. The Examiner has cited a number of references which illustrate such relatively rigid dual pipe designs. For example, The Garrett et al., Willis and Chapman references included in the last Office Action all show such designs. Many of these type designs were utilized in the past in the well drilling industries. They were acceptable in many cases for traditional vertical well drilling. However, the relatively stiff inner pipes utilized tended to make the drill string inflexible and therefore stiff and difficult to steer and bend in the borehole. As a result, the prior art dual wall drill pipes have tended to have limited applicability in the field of directional drilling, being generally limited to relatively straight hole applications.

As the Examiner is no doubt aware, directional drilling and the drilling of deviated wellbores are increasingly popular forms of oil and gas well drilling operations. In the Barnett Shale region alone, currently a hotbed of drilling and exploration in Texas, deviated wells are the norm rather than the exception.

Applicant's drill pipe, while of the dual string variety, is not as "stiff" as the prior art designs and therefore facilitates reverse circulation, horizontal directional and deviated vertical drilling. The more flexible nature of the inner tube is emphasized at several places in the Specification, for example as permitting the "double-walled drill string pipe sections to bend along the arcuate path

of a subsurface borehole as freely as a single-walled pipe" (see Applicant's Background discussion). Also, in this regard, note the discussion at about lines 13-17 of Applicant's published application:

> *The flexible, substantially non- metallic inner tube of the dual wall drill string assembly of the present invention permits the assembly to be used in all subsurface drilling applications because the inner tube is flexible and transmits considerably less bending resistance to the outer tube. "*

Because of the more flexible nature of the present "tube-within-a-tube" design, the inner tube may be reinforced with a mesh or other structural reinforcing material (see Applicant's dependent claim 4).

Applicant's "bendable design", in addition to utilizing a flexible inner tube formed of a substantially non-metallic material, is arranged with what might be referred to as a non-restrictive flow geometry. As a result, the new design is capable of conveying larger-sized cuttings due to the relatively open bore and generally constant diameter of the inner tube. These geometric features were argued in the last Response in regard to the Martin et al. reference cited by the Examiner. The unique construction of the inner tube of the assembly also provides an ideal medium for locating electrical/communication wiring which allows, e.g., information to be transmitted from the bit uphole to the well surface.

Applicant's presently claimed design thus offers a combination of at least three elements which are not found together, either in a single reference, or in the combination of references cited by the Examiner, namely:

(1) the fact that the inner tube is less "stiff" than the prior art dual string drill pipes and is thus "adapted to bend to an arcuate path of a borehole with little or no resistance";
(2) the fact that Applicant's inner pipe has a relatively open bore, allowing reverse circulation and efficient removal of cuttings; and
(3) the fact that the inner pipe material makes an ideal medium for locating electrical/communication wiring, as well as reinforcing materials such as wire mesh.

Applicant has attempted to further emphasize these novel features of the invention in the amended claim language of Claim 1 by describing the flexible inner tube as comprising "a plurality of flexible inner tube sections, each of said flexible inner tube sections having a male connection end and a

female connection end, each male section end being adapted to be connected to a female connection end on another flexible inner tube section and each female connect and being adapted to be connected to a male connection end on another flexible inner tube section." This language (taken from former dependent Claim 15) emphasizes the full bore nature of the inner tube. The amendments to Claim 1 also now call for the inner tube and the outer tube to define an annular channel there between, "wherein the non-metallic inner tube is formed of a material which allows it to bend to an arcuate path of a borehole for drilling a deviated wellbore without limiting bending of the metallic outer tube."

In the latest Office Action, the Examiner continues to reject Applicant's independent Claim 1 based upon the combination of the newly cited Wells reference (3,065,807) with the previously cited Garrett reference. The Examiner admits that Wells fails to show a flexible inner pipe, arguing that the Garrett reference makes up this deficiency. The Applicant would respectfully submit that the Examiner is not truly taking a fair reading of the teaching of either of these references, or the combination of both. In other words, neither the Garrett device or the Wells device would likely be usable for drilling deviated wells as presently claimed by Applicant.

A close reading of the Wells reference leads one to the conclusion that it is really not even intended to perform the function of a traditional "drill pipe." The design shown in this reference would not be useful for deviated directional drilling in an "arc-like path." Rather, the Wells pipe is most likely intended to be used as an existing well work over pipe/completion pipe. In fact, Figure 1 which describes the pipe, shows existing vertical well casing 11 already in place. The Wells dual wall pipe is being used to deepen the existing well and to circulate corrosive gases that could damage the steel inner tube. The suggestion that non-ferrous metals or even non-metallic materials might be useful for the inner pipe is directed to the fact that corrosive gases might be encountered, not to add flexibility to the combined inner and outer tubular members. It also appears to be the intent of the Wells design to configure an inner and outer dual wall pipe string from which the inner tube can be withdrawn, leaving the outer in the hole. Applicant's design has no such purpose or intent.

More importantly, the Wells pipe would not be functional (removable) in deviated directional drilling, without damage. It would by highly unlikely that the Wells inner pipe could be reinserted as described by the patent, in a deviated hole. The telescoping parts of the Wells design would likely bind in a deviated hole. There are also entirely too many moving parts to be economical and practical in the present day drilling operations. Springs, bearings, lugs, and the like, that are not welded securely, are all potential fishing items that would cause the rig to have major downtime.

Garrett is basically a traditional dual wall drill string of the type in existence for many years before Applicant's invention. However, as pointed out in the Background discussion of the present application, such dual wall drill strings having relatively rigid inner tubulars or pipes would not accomplish the intent of Applicant's invention. While they might allow reverse circulation, they were too stiff or rigid to be useful in drilling horizontal or deviated vertical well bores of the type which are becoming increasingly popular at the present time in the industry. The Garrett reference represents the prior art design toward which the improvement of Applicant's invention is directed, namely to provide a dual flow drill pipe which is also relatively flexible enough to allow the drilling of even highly deviated well bores.

As pointed out by the Applicant in the previous response, the objects of the Garrett reference also differ from those of Applicant's invention. The Garrett reference is primarily a reverse circulation drill pipe that secondarily can be used as a standard drill pipe if the inner tube is removed. The telescoping inner tubes are held in by a unique spring arrangement so that they can easily be removed. The Garrett design is not really a flexible inner tube which is intended to allow a dual pipe design to be used in drilling deviated wellbores, as claimed by Applicant. As explained at Col. 6, lines 9-26, the inner pipe is "axially compressed between the spring latch type holding means 270 at each end of the pipe to such an extent that it buckles." Note further with reference to Figures 13 and 14 how the inner pipe presents a constriction at the region generally shown as 270 in the drawing. This would not allow reverse circulation as claimed by Applicant. Applicant's design allows "dual flow" described in the language "wherein the annular channel is adapted to convey drilling fluid under pressure toward the inner tube first end, and the inner tube is adapted to convey cuttings toward the inner tube second end" (apparatus Claim 1). This dual flow feature is described in greater detail in Applicant's method Claim 17 as "drilling a subsurface borehole by circulating drilling fluid down the annular channel which is formed between the inner tube and the outer tube and by then returning cuttings up the inner tube diameter to the surface." The Garrett design would not work in this fashion for the reasons previously advanced.

Applicant's remaining method Claims 17-20 have been amended similarly to apparatus Claim1 to further emphasize the fact that the "non-metallic inner tube is formed of a material which allows it to bend to an arcuate path of a borehole for drilling a deviated wellbore without limiting bending of the metallic outer tube." Additionally, since these are method claims, the language has also been amended to emphasize the method steps of "drilling a deviated subsurface borehole, at least a portion of which has an arcuate path, by circulating drilling fluid down the annular channel which is formed between the inner tube and the outer tube and by then returning cuttings up the inner tube diameter

to the surface." These wellbore drilling operations are only possible because of the more flexible nature of Applicant's dual wall drill pipe design. It is the particular structural arrangement of parts and materials which allows Applicant's device to drill even highly deviated bore holes.

The Examiner also rejected Applicant's dependent Claims 5-10 and 19 based upon the combination of the Wells reference with Garrett and further in view of Terry. Terry is cited to show a "composite material tubular which houses a number of communication lines, etc." Applicant does not intend to argue the stand alone patentability of these dependent claims other than to again point out that Terry's tubing is not used for reverse circulation. It lacks an inner tube to furnish an avenue for cuttings removal.

Based upon the above arguments and amendments, Claims 1-14 and 16-20 are thought to be allowable over the art of record and an early notification of the same would be appreciated.

Respectfully submitted,

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